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ABSTRACT

Intended to help reduce the number of school eye injuries in New Jersey, this document begins with a brief review of existing legislation regarding eye protection in educational institutions and a list of elements essential in an eye safety program. Second, eye protection equipment is examined in terms of: the advantages of safety spectacles over street eyegear; personal eyewear; contact lenses; photochromatic lenses; the use of cover goggles; maintenance and disinfection of eye protective devices; and the posting of eye hazard areas. A selection chart for eye and face protectors for use in industry, schools, and colleges is followed by a chart listing operations and activities commonly conducted in vocational education, science, and fine art instructional settings; their eye hazards; and methods of protection. Appended is information regarding State law and State Board of Education rules and regulations on the use of eye protection devices; the selection of shade number for welding filters; the American National Standards Incorporated; establishing a "Wise Owl Chapter" (application included); first aid for eye injuries; guidelines for contact lenses use in industry; eye health and safety resources; and additional contacts. (CLA)

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"WHAT STUDENTS COME AWAY WITH FROM AN EFFECTIVE EYE SAFETY PROGRAM CANNOT BE MEASURED IN OBSERVABLE SKILLS ALONE."

Robert D. Jacoby
Planning Associate
N.J. Department of Education

EA

Eye Protection in Educational Institutions

Developed by:

New Jersey State Department of Education
Division of Vocational Education

PREVENT BLINDNESS.

In Cooperation with:

Eye Safety Committee—National Society to Prevent Blindness—New Jersey (NSPB-NJ)

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OFFICE OF THE COMMISSIONER

Dear Colleague:

It is imperative to maintain the best eye protection programs in our public schools, since an estimated 90 percent of eye injuries can be prevented. As educators, it is our responsibility to see that everyone in the school community follows the regulations governing eye protection.

This manual, Eye Protection In Educational Institutions, has one major purpose: to reduce the number of school eye injuries. The manual contains the essential eye safety elements. Whether you are beginning a new program or updating an existing one, you will find guidance on these pages. The eye protection program you develop should foster a positive attitude toward eye safety that will remain throughout your students' lives.

I thank everyone who contributed to this third edition. I endorse this manual and urge you to support our goal: to eliminate all eye injuries in New Jersey's schools.

Sincerely,

Saul Cooperman
Commissioner

INTRODUCTION

Eye Protection in Educational Institutions

Requirements for using industrial quality eye protection devices are stated in New Jersey Statutes Annotated Title 18A—Education and the New Jersey Administrative Code, Title 6, readopted with amendments by the Stated Board of Education in 1983 (see Appendix A).

In addition, Chapter 516, Laws of New Jersey 1983, enacted January 17, 1984, imposes on every public employer, including educational institutions, safety and health standards at least as stringent as those applicable to industry under the Occupational Safety and Health Act of 1970.

In Federal regulations, 29 CFR (Code of Federal Regulations) 1910, Subpart I—Personal Protective Equipment, the Occupational Safety and Health Administration specifies comprehensive eye and face protection requirements.

References to various standards of the American National Standard Institute (ANSI) will assist this manual's user to identify specific sources of information.

It is the responsibility of boards of education of public school districts to assure compliance with the law and New Jersey State Board of Education rules and regulations.

Compliance with and enforcement of the statutes must be integral to the ongoing instructional process. In addition, administrators, faculty members and students should continually be alert for eye accident hazards in school activities to assure that effective protective measures are being taken.

Staff members must be aware of their responsibility, in their own areas, for assuring that everyone is provided with and wears proper fitting eye protection devices. Adherence to the guidelines in this manual will be of assistance in meeting responsibility under the law.

ESSENTIAL ELEMENTS OF AN EYE SAFETY PROGRAM

1. Conduct an Eye Hazard Analysis

Before ordering protective eyewear, conduct a thorough analysis of the hazards that might be encountered by students, faculty and visitors in each educational facility. Review eye accident/injury data and specifically identify the eye hazard areas in each facility.

2. Prepare Written Documentation of the Eye Hazard Analysis for Each Facility

Include:

A. Identified eye hazard areas; and
B. The type of eye protection device(s) to be used in each area.

3. Establish an Ongoing Educational Program

Include instruction of appropriate personnel by the school nurse or medical inspector in the following:

A. Proper inspection, maintenance and storage of eye protectors;
B. Sanitization requirements;
C. First aid procedures—include use of eye wash stations; and
D. Conduct of an annual review of the program
    1. Inform all faculty and staff members of responsibilities for enforcement of policy
    2. Include eye safety in orientation for new staff members
    3. Post warning signs in eye hazard areas
    4. Review accident reports and procedures.

4. Assign Specific Responsibility for Periodic Evaluation of the Program to Ensure 100 Percent Compliance

Although one person must be assigned the responsibility for coordinating the program, school administrators and faculty must be aware of their obligations and must continually set the example by wearing appropriate eye protection whenever and wherever required. In addition, other personal protective devices may be required such as respirators or hearing protectors.

5. Establish a Wise Owl Chapter for Your School District

See page 14 for a brief description of the Wise Owl Program.

6. Take Advantage of a Wide Selection of Teaching Aids

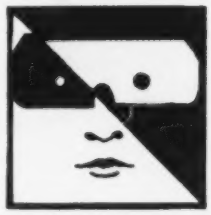
Teaching packets, films, posters and publications are available from the National Society to Prevent Blindness—New Jersey. (see pages 19 through 22 of this manual and the Northeast Curriculum Coordinating Center—New Jersey)

GENERAL INFORMATION

All eye protection equipment must meet the current requirements established in the 'American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1-1989,' and subsequent revisions thereof.

In bid specifications, and prior to delivery, purchasers should require suppliers to provide written certification that devices to be furnished meet or exceed all requirements of this standard.

I. Advantages of Safety Spectacles Over Street Eyewear



A. Safety lenses have greater thickness than standard lenses to help resist breaking.

B. Safety lenses are manufactured or treated to give greater strength.

C. Safety lenses are fitted into the front of the frame to prevent the lens from being pushed into the eye in the event of impact.

D. The frames of safety spectacles are made of special materials for greater strength and flame resistance.

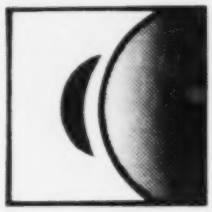
E. Safety spectacles which are equipped with side shields afford added protection.

II. Personal Eyewear

A. Streetwear 'impact-resistant' lenses are required for the general public by the Federal Food and Drug Administration (FDA). The personal eyeglass frames generally used with such lenses do not meet ANSI Z87.1 requirements. Eyewear of this type, therefore, must be used in conjunction with an approved cover goggle.

B. Students who want to wear industrial-quality prescription safety eyeglasses may do so, providing both the frame and lenses meet or exceed all ANSI Z87.1 requirements and are equipped with side shields. An indication that the personal eyewear complies with the necessary requirements is the permanent affixing of the manufacturer's trademark and the 'Z87.1' logo on major spectacle components. The lenses will bear the prescription fabricator's logo or monogram.

III. Contact Lenses

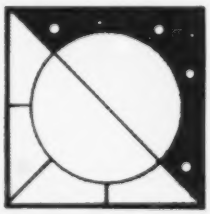


An Advisory Committee on Industrial Eye Health and Safety of the National Society to Prevent Blindness has issued the following position statement on the use of contact lenses in eye-hazardous work areas. School administrators, shop and laboratory instructors in particular, are advised to carefully consider the advice. Although the information is directed to an industrial setting, the precautions apply equally to students and staff who wear contact lenses in school shops and laboratories.

"Contact lenses may be worn in many occupations. Contact lenses provide an adequate means of visual rehabilitation for employees who have had a cataract removed from one or both eyes, who are highly near-sighted or who have irregular astigmatism from corneal scars or keratoconus. However, when the work environment entails exposure to chemical fumes, vapor or splashes, intense heat, molten metals, or highly particulate atmosphere, contact lens use should be restricted. Certain federal or state regulations may also limit their use.[1]

"Contact lenses, of themselves, do not provide eye protection in the industrial sense. For occupational use, contact lenses should be worn only in conjunction with appropriate industrial eye protection.[2] *The employer should ensure the identification of the contact lens wearer for appropriate emergency care and for protection in work areas hazardous to the eyes."*[3]

1. Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed—as per OSHA Safety and Health Standards 29 CFR 1910.134(e)(5)(ii).
2. To be of industrial quality, safety eyewear devices must meet or exceed all the requirements of the American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1-1989; or later revisions thereof, published by the American National Standards Institute, Inc.
3. NSPB 1987 Policy Statement (see Appendix F).



IV. Photochromic Lenses

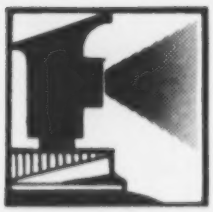
A. Photochromic lenses change depth of tint when exposed to varying degrees of ultraviolet light, i.e., daytime light conditions. Currently available photochromic lenses do not fully comply with ANSI Z87.1 requirements. Such lenses must not be used indoors as a substitute for approved industrial quality eye protective devices because:

1. they do not meet indoor light transmission requirements for clear lenses; and
2. they do not provide protection from hazardous ultraviolet or infrared radiation produced in certain shop and laboratory operations (e.g. welding, foundry).

B. If an individual must wear Rx fixed-tint lenses, as prescribed by an ophthalmic specialist, an industrial quality eye and/or face protective device appropriate for the hazard involved shall also be worn.

V. Use of Cover Goggles

Cover goggles of the chemical type with restricted ventilating ports or the shop type with multiple perforations for ventilation, must fully meet or exceed all requirements of the ANSI Z87.1 standard.



VI. Maintenance and Disinfection of Eye Protective Devices

Maintenance

Lenses of safety eyewear must be kept clean. Continuous vision through dirty lenses can cause eye fatigue and become a contributory factor to accidents. Lenses should be cleaned as needed.

1. Pitted or scratched lenses reduce vision and seriously reduce protection. They must be replaced immediately.

2. Slack, worn-out, sweat-soaked, knotted, or twisted headbands cannot hold the eye protector in its proper position. Replace headbands before they become inadequate.

3. Store eye protection equipment in suitable cases or containers when not in use.

Cleaning and Disinfecting

1. General—Eye protection devices which are shared shall be disinfected between uses. The disinfecting method shall be prescribed by the local school staff person responsible for safety.

2. Procedure—The local school staff person responsible for safety may wish to use the following procedures and methods described in the ANSI Z87.1-1979 requirements as guidance;

"Thoroughly clean all surfaces with soap or suitable detergent, and warm water. Carefully rinse all traces of soap or detergent. Completely immerse the protector for 10 minutes in a solution of modified phenol, hypochlorite, or quaternary ammonium compounds, or other disinfectant reagent, in a strength specified by the manufacturer of the safety equipment, at a room temperature of 20°C (68°F). Remove protector from solution and suspend in a clean place for air drying at room temperature or with heated air. Do not rinse because this will remove the residual effect.*

"Ultraviolet disinfecting equipment may be utilized in conjunction with the preceding washing procedure, when such equipment can be demonstrated to provide comparable disinfection.

"Spray-type disinfecting solutions and bactericides may be utilized when such pressurized spray solutions can be demonstrated to provide comparable disinfection with the immersion procedure outlined above.

"Protectors showing need for extensive cleansing should be disassembled to the extent possible without tools, prior to the washing and disinfection procedure. Replace defective parts with new ones.

"The dry parts or items should be placed in clean, dust-proof containers to protect them."

*CAUTION: use eye protection and follow manufacturers instructions.

INDIVIDUAL USERS OF EYE PROTECTION SHOULD CONSIDER THE ADVANTAGES OF PERSONALLY OWNED, APPROVED EYE PROTECTION DEVICES.

VII. Posting of Eye Hazard Areas

The entrance to all shops, laboratories, or other areas which require industrial quality eye protection should be posted with a sign indicating the requirement. In addition, machines, equipment, or process areas requiring operators to wear specific eye protection should be posted with warning signs.

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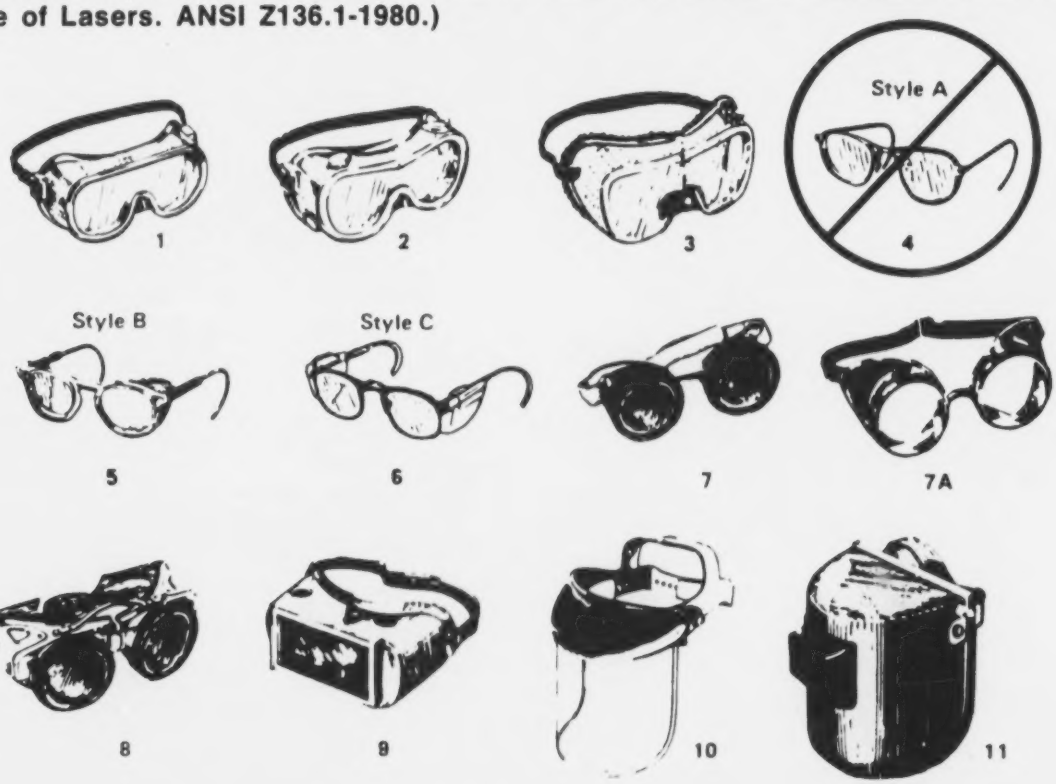
Selection Chart for Eye and Face Protectors

for Use in Industry, Schools and Colleges

This Selection Chart offers general recommendations only. Final selection of eye and face protective devices is the responsibility of management and safety specialists. (For laser protection, refer to American National Standard for Safe Use of Lasers. ANSI Z136.1-1980.)



Caution: Protectors #10 and 11 must be worn with primary eye protective devices.

1. **GOGGLES, Flexible Fitting, Regular Ventilation**
2. **GOGGLES, Flexible Fitting, Hooded Ventilation (Chemical goggles)**
3. **GOGGLES, Cushioned Fitting, Rigid Body**
- *4. **SPECTACLES, without Sideshields NOT PERMITTED**
5. **SPECTACLES, Eyecup Type Sideshields**
6. **SPECTACLES, Semi-/Flat-Fold Sideshields**
- **7. **WELDING GOGGLES, Eyecup Type, Tinted Lenses**
- 7A. **CHIPPING GOGGLES, Eyecup Type, Clear Safety Lenses**
- **8. **WELDING GOGGLES, Coverspec Type, Tinted Lenses (Illustrated)**
- 8A. **CHIPPING GOGGLES, Coverspec Type, Clear Safety Lenses (Not Illustrated)**
- **9. **WELDING GOGGLES, Coverspec Type, Tinted Plate Lens**
10. **FACE SHIELD, Plastic or Mesh Window**
- **11. **WELDING HELMET**

*Non-sideshield spectacles are available for limited hazard requiring only frontal protection. THIS TYPE IS NOT APPROVED FOR USE IN NEW JERSEY SCHOOLS.

**See Selection of Shade Number for Welding Filters on page 13.

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Eye Protection Areas & Devices

Educational situations and activities are constantly changing. An ongoing inspection program to detect eye hazards should be developed to identify the need to change or supplement the types of industrial quality eye protective devices normally used. The inspection program should be the responsibility of a specific, knowledgeable individual designated by the board of education.

The following chart lists some operations and activities commonly conducted in vocational education, science and fine arts instructional settings, their eye hazards and methods of protection.

The chart is not meant to be all encompassing or exhaustive but is designed to provide general guidance.

ACTIVITY OR OPERATION	EYE HAZARDS	EYE PROTECTIVE DEVICE(S)*
Autobody		
Body preparation	Flying particles	Spectacles (5, 6) or approved goggles (1, 2, 3); add face shield (10) for severe exposure
Painting, mixing and chemical preparation	Splashing, mists	Chemical goggles (2) (Hooded Vents)
Welding (see WELDING SECTION)		
Auto/Power Mechanics		
General operations	Flying chips, particles, dust	Spectacles (5, 6) or approved goggles (1, 2, 3); add face shield (10) for severe exposure
Lubricating, spray painting, steam and solvent cleaning	Grease, hot steam, mists, splashing	Chemical goggles (2) (Hooded Vents)
Battery servicing	Acid, sparks, explosion	Chemical goggles (2) (Hooded Vents)
Welding (see WELDING SECTION)		
Carpentry		
General operations	Flying chips, particles, dust	Spectacles (5, 6) or approved goggles (1, 2, 3); add face shield (10) for severe exposure
Chemicals, solvents	Splashing, mists	Chemical goggles (2) (Hooded Vents)
Ceramics/Enameling		
Kiln firing, dry mixing, glass fritting, throwing	Flying clay, particles, dust, explosion (firing)	Spectacles (5, 6) or approved goggles (1, 2, 3); add face shield (10) for severe exposure
Commercial Art		
Air brush, spray painting, chemical mixing, solvents, photographic solutions	Pressurized sprays, splashing	Chemical goggles (2) (Hooded Vents)
Commercial Foods		
Food frying	Hot grease	Chemical goggles (2) (Hooded Vents)
Equipment cleaning agents (i.e., oven cleaners, degreasers)	Splashing, pressurized sprays	
Electricity/Electronics		
General operations	Flying chips, solder splash, breaking glass	Spectacles (5, 6) or approved goggles (1, 2, 3)
Cathode tube servicing	Implosion, flying glass	Spectacles (5, 6) or approved goggles (1, 2, 3); with face shield (10)
Chemical etching	Acid splashing	Chemical goggles (2) (Hooded Vents)

***Numbers in parentheses refer to illustrations of Eye Protective Devices on page 7.**

ACTIVITY OR OPERATION	EYE HAZARDS	EYE PROTECTIVE DEVICE(S)
Foundry		
Core and moldmaking, chipping, grinding, general operations	Chips, flying particles	Spectacles (5, 7A, 8A); add face shield (10) for severe exposure
Heating, melting and pouring metal	Splashing, sputtering, explosion	Foundry/melters goggles with tinted plastic lenses (8) and full face shield (10)
Graphic Arts		
Cutting, stitching, drilling	Flying objects	Spectacles (5, 6) or approved goggles (1, 2, 3)
Chemical mixing, solvents, photographic solutions	Splashing	Chemical goggles (2) (Hooded Vents)
Home Economics		
Food frying	Flying hot grease	Chemical goggles (2) (Hooded Vents)
Chemical cleaners	Splashing, mists, pressurized sprays	Chemical goggles (2) (Hooded Vents)
Jewelry/Art Metal		
Silver soldering, chasing and smelting, hammering	Sputtering metal, sparks	Approved goggles (1, 2, 3)
Leatherwork		
Carving, stamping, cementing, buffing	Flying particles	Spectacles (5, 6) or approved goggles (1, 2, 3)
Masonry/Mosaic Tile		
Cutting, grinding, chipping	Flying chips, particles, and dust	Spectacles (5, 6) or approved goggles (1, 2, 3)
Acid or cleaning solutions	Splashing	Chemical goggles (2) (Hooded Vents); add face shield (10) for severe exposure
Metal Working		
General operations	Flying chips, particles, dust and objects	Spectacles (5, 6) or approved goggles (1, 2, 3); add face shield (10) for severe exposure
Pickling, etching, solvents	Splashing, mists	Chemical goggles (2) (Hooded Vents)
Plastics		
General operations	Flying chips, particles, dusts	Spectacles (5, 6) or approved goggles (1, 2, 3)
Extruding, heating, pouring, mixing	Splashing	Chemical goggles (2) (Hooded Vents)
Science		
Chemical handling experimenting, glass handling, dissecting	Splashing, flying particles	Chemical goggles (2) (Hooded Vents)
Laser experiments	Severe retinal burns—operators and observers must be protected	In compliance with ANSI Z.136.1-1986, 'Safe Use of Lasers'; or later revision thereof
Welding		
Electric arc	Welding flash, sparks, sputtering, molten metal, air bubble explosions	Welding helmet with filter lenses (11) (see Appendix B) over spectacle (7A)
Gas welding, cutting, burning and metalizing	Flying sparks and metal	Welding goggles (9) over safety spectacles (5, 6)
Chipping, grinding	Flying chips, slag and particles	Chipping goggles (7A or 8A) or eye cup type (7 or 7A)
NOTE: Use protective curtains and screens to safeguard others in the welding area.		
Woodworking		
General operations	Flyng chips, particles, dust and objects	Spectacles (5, 6) or approved goggles (1, 2, 3); add face shield (10) for severe exposure
Chemicals, solvents, finishing materials	Splashing, pressurized sprays	Chemical goggles (2) (Hooded Vents)
Visitors		
All areas	Variable	Appropriate for exposure

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APPENDIX A

State Law & State Board of Education Rules & Regulations Concerning the Use of Eye Protective Devices

N.J.S. 18A:40-12.1. Protective eye devices required for teachers, pupils and visitors in certain cases.

The board of education of every school district shall require each pupil and teacher in the public schools of the district to wear industrial quality eye protective devices while attending classes in vocational or industrial art shops or laboratories in which caustic or explosive chemicals, hot liquids or solids, hot molten metals, or explosives are used or in which welding of any type, repairing or servicing of vehicles, heat treatment or tempering of metals, or the milling, sawing, stamping or cutting of solid materials, or any similar dangerous process is taught, exposure to which might have a tendency to cause damage to the eyes. Visitors to such classrooms or laboratories shall also be required to wear such protective devices.

N.J.S. 18A:40-12.2. Rules prescribing kinds, types and quality of devices.

The commissioner, by rule or regulation, shall prescribe the kinds, types and quality of such protective devices and in so doing, the commissioner shall be guided by the standards promulgated by the American Standards Association, Inc. for such protective devices **[NOTE: A.S.A.I. is now known as the American National Standards Institute, Inc. (ANSI).]**

N.J.A.C. 6:3-1.14. Eye protection in public schools.

(a) Each district board of education shall require each pupil, teacher and visitor in the public schools of the district, including evening adult school programs, to wear appropriate eye protective devices while participating in any regular school program as defined in N.J.A.C. 6:8-1.1 in which caustic or explosive chemicals or materials, hot liquids or solids, molten materials, welding operations of any type, repairing or servicing of vehicles, heat treatment or tempering of metals, the shaping of solid materials and laser device operation and experimentation or any similar process or activity is engaged in, exposure to which might have a tendency to cause damage to the eyes.

(b) The term "appropriate eye protective device" shall include plano or prescription lenses provided the lenses and other portions of the device meet or exceed the prescribed specifications for the device. Specifications for appropriate eye protection for various activities shall meet or exceed standards described in (b)1 and 2 below. The standards, with all subsequent amendments* and supplements are hereby adopted as rules. **[NOTE: ANSI Z87.1-1989 has been accepted by the American National Standards Institute]**

1. American National Standard Practice for Occupational and Educational Eye and Face Protection, ANSI Z87.1-1979.

2. American National Standard Practice for the Safe Use of Lasers, ANSI Z136.1-1986 and eye protective procedures recommended by the manufacturer of the laser device.

i. These documents are available for review at the Administrative Code Office, Department of Education, 225 West State Street, CN 500, Trenton, New Jersey 08625.

ii. These documents may be purchased from the American National Standards Institute, Incorporated, 1430 Broadway, New York, New York 10018.

(c) Emergency eye wash fountains or similar devices, capable of a minimum 15 minutes continuous flow of eye wash solution shall be provided in classrooms, shops, laboratories or other areas where pupils or instructors are exposed to caustic materials that can cause damage to the eyes.

(d) The following types of eye protective devices shall be used to fit the designated activities or processes:

Potential Eye Hazard	Eye Protective Device(s)
1. Caustic or explosive materials	Goggles, flexible fitting, hooded ventilation; add plastic window face shield for severe exposure;
2. Dust producing operations	Goggles, flexible fitting, hooded ventilation;
3. Electric arc welding	Welding helmet in combination with spectacles with eye cup or semi or flat-fold side shields;
4. Oxy-acetylene welding	Welding goggles, eye cup type with tinted lenses; welding goggles, coverspec type with tinted lenses or tinted plate lenses;
5. Hot liquids and gases	Goggles, flexible fitting, hooded ventilation; add plastic window face shield for severe exposure;
6. Hot solids	Clear or tinted goggles or spectacles with side shields;
7. Molten materials	Clear or tinted goggles and plastic or mesh window face shield;
8. Heat treatment or tempering	Clear or tinted goggles or clear or tinted spectacles with side shields;
9. Glare operations	Tinted goggles; tinted spectacles with side shields or welding goggles, eye cup or coverspec type with tinted lenses or tinted plate lenses;
10. Shaping solid materials	Clear goggles, flexible or rigid body; clear spectacles with side shields; add plastic window face shield for severe exposure;
11. Laser device operation or experimentation	Appropriate for specific hazard;
12. Repair or servicing of vehicles	Clear goggles, flexible or rigid body; clear spectacles with side shields;
13. Other potentially eye hazardous processes or activities	Appropriate for specific hazard.

(e) Each district board of education shall establish and implement a specific eye protective policy and program to assure that:

1. No teacher, pupil or visitor shall be subjected to any hazardous environmental condition without appropriate eye protection.

2. The detection of eye hazardous conditions shall be continuous.

3. Eye protective devices shall be inspected regularly and adequately maintained.

4. Shared eye protective devices shall be disinfected between uses by a method prescribed by the local school medical inspector.

5. All eye protective devices shall meet or exceed the appropriate specifications for the various types of devices and suppliers of eye protective devices shall certify, in writing, that the device meets or exceeds said specifications.

6. Specific policy and procedure shall be established to deal with individuals who refuse to abide by established eye safety practices and procedures.

7. The use of contact lenses shall be restricted in learning environments which entail exposure to chemical fumes, vapors or splashes, intense heat, molten metals, or highly particulate atmospheres. Contact lenses, when permitted, shall only be worn in conjunction with appropriate eye protective devices and the lens wearer shall be identified for appropriate emergency care in eye hazardous learning environments.

8. All spectacle type eye protective devices shall have side shields of the eye cup, semi or flat-fold type.

9. Pupils, teachers or visitors wearing personal corrective eyewear shall be required to wear cover goggles or similar devices unless it can be certified, by competent authority, that the personal eyewear meets or exceeds standards identified in subsection (b) above.

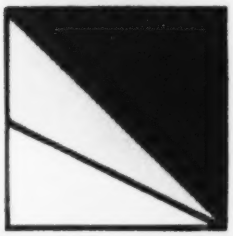
N.J.A.C. 6:53-9.4 Emergency eyewash facilities

(a) Emergency eyewash equipment shall be installed in areas which acid base battery electrolytes are used.

(b) Emergency eyewash stations may be of the portable permanently installed type. The device shall be capable of providing a continuous flow of eyewash liquid for at least 15 minutes. Eyewash stations shall be inspected and maintained in accordance with the recommendations of the manufacturer.

APPENDIX B

Selection of Shade Number for Welding Filters



The following is a guide for the selection of the proper shade numbers of filter lenses or plates used in welding. Shades more dense than those shown for various operations may be selected to suit the individual's needs.

Welding Operation	Suggested Shade Numbers*
Shielded Metal-Arc Welding, up to 5/32 in. (4mm) electrodes	10
Shielded Metal-Arc Welding 3/16 to 1/4 in. (4.8 to 6.4mm) electrodes	12
Shielded Metal-Arc Welding, over 1/4 in. (6.4mm) electrodes	14
Gas Metal-Arc Welding (Nonferrous)	11
Gas Metal-Arc Welding (Ferrous)	12
Gas Tungsten-Arc Welding	12
Atomic Hydrogen Welding	12
Carbon Arc Welding	14
Torch Soldering	2
Torch Brazing	3 or 4
Light Cutting, up to 1 in. (25mm)	3 or 4
Medium Cutting 1 to 6 in. (25 to 150mm)	4 or 5
Heavy Cutting over 6 in. (150mm)	5 or 6
Gas Welding (Light) up to 1/8 in. (3.2mm)	4 or 5
Gas Welding (Medium) 1/8 to 1/2 in. (3.2mm)	5 or 6
Gas Welding (Heavy) over 1/2 in. (12.7mm)	6 or 8

*The choice of a filter shade may be made on the basis of visual acuity and may, therefore, vary widely from one individual to another, particularly under different current densities, materials and welding processes. However, the degree of protection from radiant energy afforded by the filter plate or lens when chosen to allow visual acuity will still remain in excess of the needs of eye filter protection. Filter plate shades as low as shade 8 have proven suitable radiation-absorbent for protection from the arc/welding processes.

NOTE: In gas welding or oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the operation (spectrum).

(Excerpted with permission from the American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1)

APPENDIX C

American National Standards Institute, Incorporated*

The American National Standards Institute, Incorporated (ANSI) is a non-profit organization which coordinates the voluntary development and maintenance of several thousand national consensus standards utilized by business and industry, governmental agencies, educational institutions, and others. The American National Standard, "Practice for Occupational and Educational Eye and Face Protection, Z87.1-1979" referenced in this document, and in the federal Occupational Safety and Health Act (OSHA) Standards, was developed under the sponsorship of ANSI.

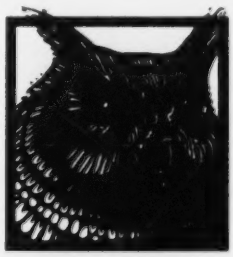
The ANSI Z87.1-1989 and other standards may be purchased by contacting:

American National Standards Institute, Inc.
1430 Broadway
New York, New York 10018

**Formerly known as American Standards Association, Inc.*

APPENDIX D

The Wise Owl Story



In 1947 a worker in the St. Louis foundry of ACF Industries, Inc. dropped an idea into a suggestion box, little knowing what an impact it would have on industrial and school eye safety. From that original idea, the Wise Owl Program was developed. The "Wise Owl Program" is an internationally recognized eye safety incentive plan to reduce needless and costly eye injuries and loss of sight, by encouraging widespread use of proper eye protective devices.

ESTABLISHING A WISE OWL CHAPTER

To establish a Wise Owl Chapter, simply duplicate, complete and return the application form provided on the following page or obtain a copy from the National Society to Prevent Blindness, 500 East Remington Road, Schaumburg, IL 60173. There is a $25 yearly administrative fee for the chapter. There need be no eligible members at the time of application.

WISE OWL INDIVIDUAL MEMBERSHIP

Membership is awarded only to those students, teachers and employees whose eyesight has been saved by wearing eye protection in an eye hazardous school situation. Award materials for students, teachers and school employees are free.

CHAPTER BENEFITS

Mailings on the latest materials, special discounts, "Insight," the NSPB newsletter, and the right to enroll unlimited individuals are some chapter benefits.

Wise Owl Program—Chapter Application

Important: This form must be completed and returned before members can be enrolled.

(Please type or print)

Company Contact _____

Title _____

Company _____

Routing Code *(if applicable)* _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Number of Employees _____

Principal Products/Business _____

Corporation Name _____

Corporate Contact _____

Title _____

Address _____

City _____ State _____ Zip _____

Agreement

We will keep accurate case records, duly authenticated, relating to employees who, in accident situations, saved one or both eyes from injury or loss of sight by wearing eye safety equipment. We will provide Wise Owl Program headquarters with a report of each case and forward the specified fee for individual membership award materials. It is understood that payment covering the applications not approved by Wise Owl Program will be refunded.

☐ Chapter annual administrative fee of $25 is enclosed.

Business officials establishing chapter:
(Please print or type)

Name _____

Title _____

Signature _____

Mail to:
National Society to Prevent Blindness
Wise Owl Program
500 East Remington Road
Schaumburg, IL 60173
Phone: (708) 843-2020

APPENDIX E

First Aid

For Eye Injuries Before Competent Medical Help is Obtained

NOTE: NO MATTER HOW MINOR THE INJURY, PROFESSIONAL MEDICAL TREATMENT MUST BE OBTAINED AS SOON AS POSSIBLE.

CHEMICAL SPLASHES

Eye damage from chemical burns may be extremely serious, as from alkalis or caustic acids; or less severe, as from chemical "irritants."

In all cases of eye contact with chemicals:

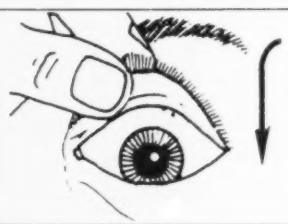
DO flush the eye with water immediately, from the inner corner of the eye outward, continuously and gently, for at least 15 minutes. Hold head under faucet or pour water into the eye using any clean container. Keep eye open as widely as possible during flushing.

DO see a doctor.

DO NOT use an eye cup.

DO NOT bandage the eye.

SPRAY CANS are an increasing source of chemical eye injury, compounded by the force of contact. Whether containing caustics or "irritants," they must be carefully used and kept away from children.



SPECKS IN THE EYE

DO lift upper eyelid outward and down over the lower lid.

DO let tears wash out speck or particle.

DO—if it doesn't wash out—keep eye closed, bandage lightly and see a doctor.

DO NOT rub the eye.

BLOWS TO THE EYE

DO apply cold compresses immediately, for 15 minutes; again each hour as needed to reduce pain and swelling.

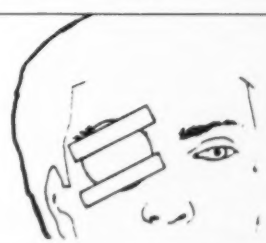
DO—in case of discoloration or "black eye," which could mean internal damage to the eye—see a doctor.

CUTS AND PUNCTURES OF THE EYE OR EYELID

DO bandage lightly and see a doctor at once.

DO NOT wash out eye with water.

DO NOT try to remove an object stuck in the eye.



For Contact Lens Wearers:

If attempts to remove contact lens are not immediately successful, begin flushing without delay. Be aware that the flushing itself may dislodge the lens. If not, remove the lens as soon as practical.

National Society to Prevent Blindness (NSPB)

GUIDELINES AND RECOMMENDATIONS FOR CONTACT LENS USE IN INDUSTRY

As a service to business, NSPB has revised its statement on the wearing of contact lenses in the workplace.

It is estimated that nearly two million individuals in the U.S. are fitted with contacts each year and between 12 and 15 million Americans already wear them. Many of these individuals are employed in industry.

Contact lenses sometimes provide a superior means of visual rehabilitation for employees who have had a cataract removed from one or both eyes, who are severely nearsighted, or who have irregular astigmatism from corneal scars or keratoconus. Except for situations in which there is significant risk of ocular injury, individuals may be allowed to wear contact lenses in the workplace. Generally, contact lens wearers who have experienced long term success with contacts, can judge for themselves whether or not they can wear contact lenses in their occupational work environments. However, contact lens wearers must conform to the prerogatives and directions of management regarding contact lens use. When the work environment entails exposures to chemicals, vapors, splashes, radiant or intense heat, molten metals or a highly particulate atmosphere, contact lens use should be restricted accordingly. Contact lens use considerations should be made on a case-by-case basis in conjunction with the guidelines of the Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH).

RECOMMENDATIONS

The National Society to Prevent Blindness makes the following recommendation as a service to management who must direct contact lens use and the employees who must wear them:

1) Occupational safety eyewear meeting or exceeding ANSI Z87.1 standards should be worn at all times by individuals in designated areas.

2) Employees and visitors should know where contacts are allowed.

3) Where contacts are allowed, the type of eye protection required should be specified.

4) A specific written management policy on contact lens use should be developed with employee consultation and involvement.

5) Restrictions on contact lens wear do not apply to usual office or secretarial employees.

6) A directory should be developed which lists all employees who wear contacts. This list should be maintained in the plant medical facility for easy access to trained first aid personnel. Foremen or supervisors should be informed of individual employees wearing contact lenses.

7) Medical and first aid personnel should be trained in the proper procedures and equipment for removing both hard and soft contacts from conscious and unconscious workers.

8) Employees should be required to keep a spare pair of contacts and/or a pair of up-to-date prescription spectacles in their possession. This action will allow the employees to perform their job functions, should they damage or lose a lens while working.

9) Employees who wear contact lenses should be instructed to remove contacts immediately if redness of the eye, blurring of vision, or pain in the eye associated with contact lens use occurs.

Recognized as an international authority on sight conservation, NSPB in its eye safety program offers a wide range of educational materials related to eye safety on the job, in sports, in the home, in schools, and on the farm. It also provides telephone consultation service on eye safety programs.

National Society to Prevent Blindness
500 East Remington Road
Schaumburg, IL 60173

Center For Sight
1-800-221-3004

Prevent Blindness
303 George Street
New Brunswick, NJ 08901
(201) 545-2020

Revised 3/87

Eye Health and Safety Resources

AVAILABLE FROM: NATIONAL SOCIETY TO PREVENT BLINDNESS—NEW JERSEY
303 George Street
New Brunswick, New Jersey 08901
201-545-2020

Films*

Note: A complete catalog of publications and films is available on request. Costs may be subject to change.

The Eyes Have It

8 minute, 16mm, color film. Marionettes demonstrate eye safety Grades K-3.
(Also see supplementary teacher/student packet.)..... $130
1/2" VHS Video . . . $ 80

An Option To See

17 minute, 16mm color film. Encourages students, grades 7-12 to use safety eyewear in labs and shops..... Rental Only

It's Still Up To You

12 minute, 16mm, color film. Forceful industrial eye safety message including an eye surgery sequence..... $315

Out Of Mind/Out Of Sight

8 minute, slide/tape is included in this Battery Safety information kit. Proper jump-starting batteries and first-aid techniques are given in the leader's guide and student workbook..... $ 80
1/2" VHS Video . . . $ 80

Protect Your Eyes On The Job

13 minute, 16mm, color film. Designed to motivate the wearing of eye protection. Bill Frank talks about his life since his blinding accident and shows his blinded eyes..... $315
1/2" VHS or 3/4" Video . . . $315

See To It

8 minute, color video only. Depicts proper industrial selection of protective eyewear. Includes a re-enactment of a serious accident and one that has been prevented.
1/2" VHS or 3/4" Video..... $ 35

Vision: A Treasure To Guard

16 minute, slide/tape is included in this home eye safety kit. Leader's guide and topics on mowing lawns, cutting logs and jump-starting cars..... $150

*Loans are available. To cover postage and handling costs, send $15 for 5 days or $25 for 10 days.
Videos are for purchase only.

Guides

Eye Safety Manual, "Eye Protection in Educational Institutions"

A revised guide to eye safety programs and the use of eye protective devices in New Jersey (also available from the New Jersey State Department of Education, Division of Vocational Education)..... FREE

A Guide for Controlling Eye Injuries in Industry

24 pages on what industry needs to know about eye protection (Under Revision)

Children's Eye Health Guide

A 32-page source book for school nurses and teachers. Answers questions such as who should be screened for vision and when, what tests to use and how to do it. Valuable reference section on first aid safety..... $3.25

Posters and Charts

Eye Hazard Area . . . Wear Your Eye Protection..... 2/$1
8-1/2" x 11"—Black on Yellow

'How We See,' 22" x 28" wall chart showing eye cross section and eye diagram..... $1 each

How's Your Vision—Family Home Eye Test..... $1 each
$14/100

Students can be taught to screen their family's vision. Five do-it-yourself tests are provided that can screen for vision problems from ages 3 to 103. The E-chart is designed for preschoolers, and the other tests for near and distance vision are for everyone. The Amsler Grid test is planned for senior citizens and early detection of macular problems and the glaucoma risk factor test heightens the awareness of this potentially-blinding condition.

Teaching Packets

The Eyes Have It (Grades K-3)

Teacher's packet guide to teaching eye health and safety at home and school, with photocopy masters for classroom activities included..... $ 3.50
(Also see Films. Can be used with or without companion film, "The Eyes Have It".)

The Magic of Sight (Grades 5-6)

A multimedia kit containing a 13 minute color filmstrip and audio cassette . . . teaches about vision, eye health and safety. Includes a teacher's guide, 22" x 28" chart of the eye and how it works, first aid sticker, three (3) quiz testing sheets and a crossword puzzle sheet..... $14.50

An Option To See (Grades 7-12)

Teacher's package is under revision. See films, "An Option to See," for an interim program.

Brochures, Pamphlets and Booklets

First Aid for Eye Emergencies
A sticker for first aid cabinets..... $14/100

How To Jump-Start a Car Safely
Auto battery sticker..... $14/100

The Eye and How We See
Diagram defines parts and illustrates how the eye works..... $12/100

Eye Safety Is No Accident
Protect yourself from everyday eye hazards (Under Revision)

Questions on Eye Safety
Answers the most important questions about eye safety..... $12/100

Don't Play Games With Your Eyes
A must for physical education. An 8-page brochure that describes sports risks to eyes, how to protect eyes, and recognizing eye injuries..... $15/100

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ADDITIONAL RESOURCES

American National Standards Institute, Inc.
1430 Broadway
New York, New York 10018
Tel: (212) 354-3300

American Society of Safety Engineers
c/o New Jersey State Safety Council
6 Commerce Drive
Cranford, New Jersey 07016
Tel: (201) 272-7712/2930

American Society of Safety Engineers
1800 East Oakton Street
Des Plaines, Illinois 60018
Tel: (312) 692-4121

National Safety Council
North Michigan Avenue
Chicago, Illinois 60611
Contact: Head, School and College Department
Tel: (312) 527-4800

National Society to Prevent Blindness—New Jersey
303 George Street
New Brunswick, New Jersey 08901-2064
Contact: Executive Director
Tel: (201) 545-2020

National Society to Prevent Blindness
500 East Remington Road
Schaumburg, Illinois 60173
Contact: Director, Eye Safety
Tel: (708) 843-2020
(800) 221-3004

New Jersey State Department of Education
Division of Vocational Education
225 West State Street
CN 500
Trenton, New Jersey 08625
Contact: Safety Coordinator
Tel: (609) 292-5744

New Jersey State Safety Council
6 Commerce Drive
Cranford, New Jersey 07016
Tel: (201) 272-7712/2930

New Jersey State Department of Labor
New Jersey State Safety Awards Program
28 Yard Avenue—3rd floor
Trenton, New Jersey 08625
Tel: (609) 292-0404

Northeast Curriculum Coordination Center
New Jersey State Department of Education
Division of Vocational Education
Crest Way
Aberdeen, New Jersey 07747
Tel: (201) 290-1900

OSHA Consultation Services
Division of Workplace Standards
New Jersey State Department of Labor
28 Yard Avenue—3rd floor
Trenton, New Jersey 08625
Tel: (609) 292-0404

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGION II AREA OFFICES

AREA OFFICE	COUNTIES
U.S. Department of Labor—OSHA Plaza 35 (Suite 205) 1030 St. Georges Avenue Avenel, New Jersey 07001 Tel: (201) 750-3270	Hunterdon, Middlesex, Somerset, Union, and Warren
U.S. Department of Labor—OSHA Marlton Executive Park 701 Route 73 South, Bldg. 2 Marlton, New Jersey 08053 Tel: (609) 757-5181	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Monmouth, Ocean, and Salem
U.S. Department of Labor—OSHA 2 East Blackwell Street Dover, New Jersey 07801 Tel: (201) 361-4050	Essex, Hudson, Morris, and Sussex
U.S. Department of Labor—OSHA Teterboro Airport Professional Bldg. 500 Route 17 Hasbrouck Heights, New Jersey 07604 Tel: (201) 288-1700	Bergen and Passaic

The information and recommendations contained in this publication have been compiled from sources considered to be accurate. The publication is provided with the understanding that the National Society to Prevent Blindness and its affiliates are not engaged in rendering professional eye care services through its distribution. The National Society to Prevent Blindness and its affiliates do not intend for the publication to serve as a complete resource for eye health, eye care or eye safety information; or as a substitute for professional eye care.

EYE HAZARD AREA

WEAR YOUR EYE PROTECTION

NATIONAL SOCIETY TO PREVENT BLINDNESS
303 George Street, New Brunswick, N.J. 08901-2064 (201) 545-2020
Affiliate of National Society to Prevent Blindness

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